DEPARTMENT OF DEFENSE
IMPLEMENTATION PLAN FOR FY 2002

To Meet the Requirements of Executive Order 13123
"Greening the Government through efficient Energy Management"

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Introduction. Executive Order (EO) 13123, "Greening the Government through Efficient Energy Management," set ambitious, but achievable energy management goals for the Federal Government. These goals specifically targeted greenhouse gas production, energy efficiency, renewable energy, petroleum use in facilities, source energy consumption and water usage. Section 101 charges the Federal Government, as the Nation's largest energy consumer, to significantly improve its energy management in order to save taxpayer dollars and reduce emissions that contribute to air pollution and global climate change. Additionally, President's Bush's Memorandum on May 3, 3001 directed the Federal agencies to energy conservation in Federal facilities to maximum extent consistent with the effective discharge of public responsibilities.

The EO not only requires a reduction in emissions and improvement in energy management, it also instructs the Federal Government to provide leadership to promote energy efficiency, water conservation, the use of renewable energy products, and to help foster markets for emerging technologies. The Department of Defense (DoD) has undertaken an integrated program to optimize the management of its utility systems—seeking to increase efficiency and reduce costs while improving reliability and safety. This program has three elements: (1) reducing energy and water consumption; (2) taking advantage of deregulated energy commodity markets; and (3) privatizing the utilities infrastructure.

Conserving energy is important to the Department, because it saves money and reduces greenhouse gas emissions harmful to the environment. In Fiscal Year (FY) 2001, DoD spent over $2.8 billion to buy energy for its installations, consuming 250 trillion British Thermal Units (BTU). This was a $400 million increase from the previous year despite reducing our energy use by about 3 trillion BTU. DoD intends to meet the goals of this order by implementing the following broad strategies:

- Implement cost-effective energy conservation projects with direct appropriations and alternative financing through Utility Energy Service Contracts (UESC) and Energy Savings Performance Contracts (ESPC), and by procuring energy-efficient products and services.
- Implement water conservation best management practices to achieve water efficiency.
- Promote energy renewable technology by purchasing renewable power and implementing renewable energy projects when cost-effective based on life-cycle analysis.

In accordance with EO 13123, all Federal agencies will prepare an Annual Implementation Plan. This plan was built upon each Defense Component's submitted plan and has been prepared to meet the requirements of the EO. In addition, the plan will provide general guidance to DoD facility managers, energy managers, and other decision makers on the requirements of the order and strategies to adopt and actions to take to meet these requirements. Each Defense Component shall comply with the general measures of this plan as well as their own submitted implementation plan's specific measures.

Goals of the Executive Order. EO 13123 sets forth seven goals for the Federal Government to meet in order to significantly improve its energy management, thereby saving taxpayer dollars

and reducing emissions that contribute to air pollution and global climate change. These goals are:

- **Greenhouse Gases Reduction** - Through life-cycle cost-effective measures, each agency shall reduce its greenhouse gas emissions attributed to facility energy use by 30 percent by 2010 compared to such emissions levels in 1990. (Sec. 201)
- **Energy Efficiency Improvement** - Through life-cycle cost-effective measures, each agency shall reduce energy consumption per gross square foot of its facilities, excluding facilities covered in section 203 of the order, by 30 percent by 2005 and 35 percent by 2010 relative to 1985. (Sec. 202)
- **Industrial and Laboratory Facilities** - Through life-cycle cost-effective measures, each agency shall reduce energy consumption in Industrial and Laboratory Facilities per gross square foot, per unit of production, or per other unit as applicable by 20 percent by 2005 and by 25 percent by 2010 relative to 1990. (Sec. 203)
- **Renewable Energy** - Each agency shall strive to expand the use of renewable energy within its facilities and in its activities by implementing renewable energy projects and by purchasing electricity from renewable energy sources. In support of the Million Solar Roofs initiative, the Federal Government shall strive to install 2,000 solar energy systems at Federal facilities by the end of 2000, and 20,000 solar energy systems at Federal facilities by 2010. (Sec. 204)
- **Petroleum Use** - Through life-cycle cost-effective measures, each agency shall reduce the use of petroleum within its facilities. Agencies may accomplish this reduction by switching to a less greenhouse gas-intensive, nonpetroleum energy source, such as natural gas or renewable energy sources; by eliminating unnecessary fuel use; or by other appropriate methods. (Sec. 205)
- **Source Energy** - The Federal Government shall strive to reduce total energy use and associated greenhouse gas and other air emissions, as measured at the source. To that end, agencies shall undertake life-cycle cost-effective projects in which source energy decreases, even if site energy use increases. (Sec. 206)
- **Water Conservation** - Through life-cycle cost-effective measures, agencies shall reduce water consumption and associated energy use in their facilities to reach the goals set under Sec. 503(f) of the EO. Where possible, water cost savings and associated energy cost savings shall be included in Energy-Savings Performance Contracts and other financing mechanisms. (Sec. 207)

I. <u>Management and Administration</u>. Energy management on DoD installations is focused on improving efficiency, eliminating waste, and enhancing the quality of life while meeting mission requirements. Accomplishing these objectives will reduce costs and ensure that the program goals are achieved.

The DoD facilities energy program is decentralized with Defense Component headquarters providing guidance and funding, and each military installation managing site-specific energy and water conservation programs. Funding of energy projects is multi-faceted, using a combination of Government and alternative financing initiatives. Installations are responsible for maintaining awareness, developing and implementing projects, and ensuring that new construction meets sustainable design criteria.

A. Energy Management Infrastructure.

1. Senior Agency Official and Agency Energy Team. The Principal Deputy Under Secretary of Defense (Acquisition, Technology and Logistics) is the DoD Senior Agency Official responsible for meeting the goals of EO 13123. The existing DoD Installations Policy Board (IPB), chaired by the Deputy Under Secretary of Defense (Installations and Environment) and chartered to address a broad spectrum of installations issues, has been designated as the DoD Agency Energy Team. The membership of the IPB contains the cross-section of DoD senior leadership necessary to make decisions needed to remove obstacles hindering compliance with the EO.

B. Management Tools. To reach the goals of the Order, DoD will use a variety of management tools, including:

1. Awards. Energy conservation awards are to be presented to individuals, organizations, and installations in recognition of their energy-savings and water conservation efforts. In addition to recognition, these awards provide motivation for continued energy-reduction achievements. The Components will continue their very successful individual awards programs and also will participate in the DoE Federal Energy and Water Management Awards Program. This program recognizes organizations, small groups, and individuals for outstanding achievements in several energy-related categories within the Federal sector. Categories include energy management, renewable energy, water conservation, ESPC, and beneficial landscaping. Each Component can also recognize one outstanding individual for overall contribution to the program. Additionally, Components will continue to incorporate on-the-spot awards and incentive awards to recognize exceptional performance and participation in the energy management program.

2. **Performance Evaluations.** Energy management provisions will continue to be included in performance plans of the DoD Energy Chain of Command, including major command, base and site energy managers.

3. Training and Education. Awareness and training programs are important for DoD to achieve and sustain energy-efficient operations at the installation level. For FY 2002, DoD's goal is to train over 1,869 personnel through either commercially available or in-house-generated technical courses, seminars, conferences, software, videos, and certifications. Defense Components will increase awareness and publicize program goals, tools, and progress at different organizational levels through web sites, e-mails, displays, reports, newsletters, handbooks, and guidance. Additionally, DoD personnel will actively participate in the Energy 2002 conference in Palm Springs, California.

DoD will continue to have an active program to identify and procure energy-efficient products through the Defense Logistics Agency (DLA). DLA and General Services Administration (GSA) product catalogs will be widely used, as well as the Construction Criteria Base (available on CD-ROM and the Internet). Purchasing agents are strongly

encouraged to procure ENERGY STAR® products and products in the top 25 percent of energy efficiency when they are cost-effective.

4. Showcase Facilities. Showcase facilities demonstrate the use of innovative techniques to improve energy and water efficiency. Although hindered by a lack of funding in previous years, the Department intends to emphasize the benefit of these facilities, with a target of each Service developing at least one showcase facility per year.

II. Implementation Strategies. EO 13123 provides DoD with a number of strategies to adopt to meet the goals of the order and promote Federal leadership in energy management. It is DoD's philosophy to give the Defense Components the flexibility of managing their own energy programs to meet these goals. The primary objectives are to improve energy efficiency and eliminate energy waste.

A. **Life-Cycle Cost Analysis.** DoD facilities will continue to utilize life-cycle cost analysis in making decisions about their investment in products, services, construction, and other projects to lower the Federal Government's costs and to reduce energy and water consumption. All projects with 10 year or less simple payback that fit within financial constraints will be implemented. DoD will consider the life-cycle-costs of combining projects, and encourages bundling of energy efficiency projects with renewable energy projects, where appropriate. The use of passive solar design and active solar technologies will be required when cost-effective over the life of the project. Sustainable development projects will continue to use life-cycle costing methodology and follow the whole building design guide.

B. **Facility Energy Audits.** Energy audits evaluate current energy usage and assist installations in determining the best locations to incorporate energy savings measures. EO 13123 requires Federal agencies to audit approximately 10 percent of their facilities each year. Since auditing 10 percent of DoD facilities each year has been cost prohibitive in the past, Components are encouraged to use either appropriated funding or alternative financing through UESC and ESPC projects to conduct their energy audits. In addition to facility audits, software such as Renewable and Energy Efficiency Planning and the Federal Energy Decision Screening system have been developed to assist this process by determining the investment required to meet energy reduction goals.

C. **Financing Mechanisms.** Partnerships with the private sector through Utility Energy Service Contracts (UESC) and Energy Savings Performance Contracts (ESPC) are a crucial tool for financing energy efficiency measures and allow installations to improve their infrastructure and pay for the energy efficiency measures through the savings generated by the project over time. For FY 2002, DoD through a decentralized approach will strive to awarded approximately 87 UESC and ESPC task orders/contracts worth $459 million to produce an estimated annual savings of 2.38 trillion Btu. These contracts will include infrastructure upgrades and new equipment to help the installations reduce energy and water consumption. Projects will consist of new thermal storage systems, chillers, boilers, lights, motors, EMCS systems and water reducing devices. For FY 2002, Congress appropriated $27 million for

the Energy Conservation Investment Program (ECIP) in which $6 million will be applied to a service-wide renewable energy assessment and $21 million to energy savings projects.

D. **ENERGY STAR® and Other Energy-Efficient Products.** When life-cycle cost-effective, the Defense Components are encouraged to select ENERGY STAR® and other energy-efficient products when acquiring energy-consuming products. Guidance generated by DoE, GSA and DLA for energy–efficient products are being incorporated into the sustainable design and development of new and renovated facilities. Defense components will invest in energy-efficient technologies, such as high efficiency lighting and ballasts, energy-efficient motors, and use of packaged heating and cooling equipment with energy efficiency ratios (EER) that meet or exceed Federal criteria for retrofitting existing buildings. Information technology hardware, computers and copying equipment will be acquired under the Energy Star Program using GSA Schedules, Government-wide contracts, or Service Contracts. The DLA distribution centers serve as the focal point of DoD's program to procure energy and water efficient products and will continue to be a leader in increasing the use of these products by such programs as their two-for-one compact fluorescent light initiative. Procuring agents, including users of government credit cards, will continue to be encouraged to procure ENERGY STAR® products and other products in the top 25 percent of energy efficiency.

E. **ENERGY STAR® Buildings.** The ENERGY STAR® Building program was developed by the U.S. Environmental Protection Agency (EPA) to promote energy efficiency in buildings. Actual ENERGY STAR® Buildings certification and labeling is based on measured building data and a comparison with archetypes in various regions of the country. Since DoD buildings are not generally metered and temporary metering schemes may be cost prohibitive, DoD has not been able to certify buildings under this program. However, DoD, DoE, and EPA completed a memorandum of understanding regarding ENERGY STAR® labels for all DoD buildings in June 1997. The MOU considers buildings as ENERGY STAR® buildings equivalents if they were included in comprehensive audits and all projects with a 10-year or better payback are implemented, to the maximum extent practicable, within agency resources and allows the installation to self-certify and develop a local label for non-metered buildings. DoD components will strive to assess their building against the ENERGY STAR® criteria to determine an accurate count of the number of buildings in which energy projects with a 10-year or better payback have been installed and report this equivalent number for the FY 2002 Annual Energy Report.

F. Sustainable Building Design. Sustainability initiatives require an integrated design approach to the life-cycle of buildings and infrastructure. The concepts of sustainable development as applied to DoD installations will continue to be incorporated into the master planning process of each of the Services. DoD components will document sustainable development costs on 1391 forms and are encouraged to approach land use planning and urban design in a holistic manner and integrate it with energy planning. Additional information on "sustainable design" can be found in the "Whole Building Design Guide."

This intuitive, internet-based tool (located at www.wbdg.org) serves as a portal to the design criteria and other resources needed to construct cost-effective, sustainable buildings.

G. Energy Efficiency in Lease Provisions. DoD will continue to emphasizes energy and water conservation in leased facilities and each Service will issue guidance directing that all leased spaces shall comply with the energy and water efficiency requirements of the Energy Policy Act of 1992. While some of the Services are moving away from the use of leased buildings, preferring to make use of government-owned facilities, where leasing of building continues, it is DoD's intent to have the landlord make appropriate investments in energy efficiency. These leases will amortize the investments over the economic life of the improvements. Build-to-lease solicitations for DoD facilities will contain criteria encouraging sustainable design and development, energy efficiency, and verification of building performance. DoD will continue to rely upon GSA to ensure the above provisions are included in buildings that they lease for DoD.

H. Industrial Facility Efficiency Improvements. Initiatives for industrial facility efficiency improvements utilizing fuel switching, lighting efficiency upgrades**,** waste heat usage, and thermal storage units will continue for FY 2002. Dual-path air conditioning to control humidity as an alternative to natural gas or propane fired desiccant dehumidification systems, heat-pipe technology for dehumidification, and domestic hot water heat reclaim systems will continue to be utilized for commissary stores. Exploration in efficiency opportunities in renewable energy technologies such as wind, biomass, geothermal ground source heat pumps and photovoltaics will also be continued.

I. Highly Efficient Systems. DoD encourages the Components to combine cooling, heating, and power systems in new construction and/or retrofit projects when cost-effective. Components are also encouraged to survey local natural resources to optimize use of available biomass, bioenergy, geothermal, and other renewable or naturally occurring energy sources when life-cycle cost-effective. Examples identified for FY 2002 include: completion of the construction of a cogeneration plant at *MAGTFTC Twenty-nine Palms, CA*, design and award of upgrades to its cogeneration plant at *Naval Medical Center, San Diego*, *CA*; installing water source heat pumps in the HQ ACC Campus facilities at *Langley AFB, VA*; and de-centralizing the heating plant at the *Defense Supply Center, Columbus OH.*

J. Off-Grid Generation. DoD's policy is to privatize its electrical distribution systems (and other utilities). In most cases, larger scale, off-grid, electrical generation systems should be owned and operated by contractors. Off-grid generation, owned and operated by Defense Components may make sense for mission criticality and remote sites when it is life-cycle cost-effective. In these cases, innovative energy reduction technologies will be utilized. Examples being planned by the Components include a 750 kW photovoltaic array at *Navy Region Southwest, San Diego CA*, a 1.5 MW wind generation plant at *Lajes Field Azores*, a 30 MW geothermal electrical generation plant at *NAS Fallon, NV* and a 2 MW off-grid generator at *Volk Field ANG WI*.

K. Electrical Load Reduction Measures

As a result of the President's May 3rd Directive, DoD Installations' emergency load reduction

plans were updated. Components will continue to identify load shedding techniques to cut electricity consumption in buildings and facilities during power emergencies. Examples of these techniques include: thermal storage systems, duty cycling of A/C in military family housing by energy management control systems, alternative energy sources for air-conditioning, turning off unneeded lights with motion sensors and separate lighting circuits, and Distributed Energy Resources for on-site generation using micro-turbines, fuel cells, combined heat and power, and renewable technologies. In addition, The Department continues to focus its energy conservation program on measures that reduce electric consumption.

L. Water Conservation. EO 13123 requires water efficiency improvement goals for Federal agencies, suggesting specific strategies that include development of a water management plan and adoption of at least four of the Federal Energy Management Program Water Efficiency Improvement Best Management Practices (BMP). The BMPs range from system-related (boiler/steam, cooling tower, faucets and showerheads, etc.) to public information and education programs. Installations will incorporate water management plans in their existing operation and maintenance plans and will focus on dissemination of information to all levels to educate personnel on water conservation practices. Audits will be conducted to identify the best opportunities and where economical, installations will initiate water conservation projects using UESC and ESPC. Defense Components will continue to concentrate on water conservation methods such as early leak detection and repair, installation of low-flow water-efficient fixtures in housing and administration buildings, and public awareness programs.